

## Claims

### WHAT IS CLAIMED IS:

1. A method for acquiring a target from a vehicle comprising a sensor mounted thereon having a field of view centered on a boresight, said method comprising:

rotating the sensor about a first fixed axis;

rotating the sensor about a second fixed axis generally perpendicular to the first axis as the sensor is rotated about the first axis;

moving the sensor so the boresight is aligned with the target; and

stopping movement of the sensor when the boresight is aligned with the target.

2. A method in accordance with claim 1 wherein the sensor is rotated about the first axis at a rate different than the sensor is rotated about the second axis.

3. A method in accordance with claim 2 wherein the sensor is rotated about the first axis at a rate greater than the sensor is rotated about the second axis so the sensor generally follows a spiral trajectory as the sensor is simultaneously rotated about the first axis and the second axis.

4. A method in accordance with claim 3 wherein the sensor is fixedly mounted on the vehicle, the first axis initially corresponds to a roll axis of the vehicle, the second axis initially corresponds to a pitch axis of the vehicle, and the boresight is initially aligned with the roll axis of the vehicle.

5. A method in accordance with claim 1 wherein the sensor is rotated about the first axis at a rate of between about 0.01 °/sec and about 1 °/sec.

6. A method in accordance with claim 1 wherein the sensor is rotated about the second axis at a rate of between about 0.01 °/sec and about 1 °/sec.

7. A method in accordance with claim 1 wherein the sensor is rotated about the first axis and the second axis using one of a thruster and a reaction wheel.

8. A method in accordance with claim 1 wherein moving the sensor so the boresight is aligned with the target comprises changing the rotation of the sensor about at least one of the first axis and the second axis.

9. A system for acquiring a target from a vehicle having a body, said system comprising:

a sensor mountable on the vehicle body having a field of view centered on a boresight;

a drive for rotating the sensor about a first fixed axis and about a second fixed axis perpendicular to the first axis; and

a processor operatively connected to the sensor and the drive, said processor being configured to:

activate the drive to rotate the sensor about the first axis and to rotate the sensor about the second axis as the sensor is rotated about the first axis;

activate the drive to move the sensor so the boresight is aligned with the target; and

activate the drive to stop movement of the sensor when the boresight is aligned with the target.

10. A system in accordance with claim 9 wherein the drive and the processor are configured to rotate the sensor about the first axis at a rate different than about the second axis.

11. A system in accordance with claim 10 wherein the drive and the processor are configured to rotate the sensor about the first axis at a rate greater than about the second axis so the sensor generally follows a spiral trajectory as the sensor is simultaneously rotated about the first axis and the second axis.

12. A system in accordance with claim 11 wherein the sensor is fixedly mountable on the vehicle body, the first axis initially corresponds to a roll axis of the vehicle body, the second axis initially corresponds to a pitch axis of the vehicle body, and the boresight is initially aligned with the roll axis of the vehicle body.

13. A system in accordance with claim 9 wherein the drive and the processor are configured to rotate the sensor about the first axis at a rate of between about 0.01 °/sec and about 1 °/sec.

14. A system in accordance with claim 9 wherein the drive and the processor are operative to rotate the vehicle body about the second axis at a rate of between about 0.01 °/sec and about 1 °/sec.

15. A system in accordance with claim 9 wherein the sensor has a generally circular field of view of about 60°.

16. A space vehicle comprising:

- a body;
- a sensor fixedly mounted on the body having a field of view centered on a boresight;
- a drive mounted on the body for rotating the body about a first fixed axis and about a second fixed axis generally perpendicular to the first axis; and
- a processor operatively connected to the sensor and the drive, said processor being configured to:
  - activate the drive to rotate the body about the first axis and to rotate the body about the second axis as the body is rotated about the first axis;
  - activate the drive to move the body so the boresight is aligned with the target; and
  - activate the drive to stop movement of the body when the boresight is aligned with the target.

17. A space vehicle in accordance with claim 16 wherein the drive and the processor are configured to rotate the body about the first axis at a rate different than about the second axis.

18. A space vehicle in accordance with claim 17 wherein the drive and the processor are configured to rotate the body about the first axis at a rate greater than about the second axis so the sensor generally follows a spiral trajectory as the body is simultaneously rotated about the first axis and the second axis.

19. A space vehicle in accordance with claim 18 wherein the first axis initially corresponds to a roll axis of the body, the second axis initially corresponds to a pitch axis of the body, and the boresight is initially aligned with the roll axis of the body.

20. A space vehicle in accordance with claim 16 wherein the drive comprises one of a thruster and a reaction wheel.